

CLAIMS

What is claimed is:

1 1. A method of accessing information about a resource associated with a
2 network device, comprising:
3 receiving a request from an application for information about a resource associated
4 with a network device;
5 selecting a layer in a network protocol stack having multiple layers for
6 communicating with the requested resource associated with the network device;
7 establishing an inner layer socket for communicating at the selected layer using an
8 inner layer application programming interface (IL API) and a socket identifier associated
9 with the requested resource, wherein the inner layer socket communicates using the selected
10 layer and bypasses other layers in the network protocol stack;
11 transmitting the request for information about the resource through the inner layer
12 socket and the socket identifier ;
13 receiving the information about the resource in response to the transmission made
14 through the inner layer socket; and
15 passing the information about the resource through the inner layer socket to the
16 application making the request.

1 2. The method of claim 1, wherein said request includes header information
2 associated with a transport layer and the inner layer socket is a transport socket.

1 3. The method of claim 2, wherein the network protocol stack is compatible with
2 TCP/IP and the transport socket is compatible with a TCP or UDP transport layer protocol.

1 4. The method of claim 1, wherein said request includes header information
2 associated with a network layer and the inner layer socket is a network socket.

1 5. The method of claim 4, wherein the network protocol is compatible with
2 TCP/IP and the network socket is compatible with an IP network layer protocol.

1 6. The method of claim 1, wherein said request includes header information
2 associated with a link layer and the inner layer socket is a link socket.

3 7. The method of claim 6 wherein the network protocol is compatible with
4 TCP/IP and the link socket is compatible with a link layer protocol.

1 8. The method of claim 1 wherein selecting a layer in a network protocol stack
2 further includes determining the layer in the network protocol stack that the requested
3 resource uses for communication.

1 9. The method of claim 1 wherein the IP layer in a TCP/IP network protocol is
2 selected when a Internet Control Message Protocol (ICMP) resource communicates at the
3 network layer in the network protocol.

1 10. The method of claim 1 wherein the link layer in a TCP/IP network protocol is
2 selected when an Address Resolution Protocol (ARP) resource communicates at the link
3 layer in the network protocol.

1 11. The method of claim 1 wherein the physical layer in a network protocol is
2 selected when a physical port resource uses the physical layer for communication.

1 12. The method of claim 1 wherein the IL API provides a transport socket to
2 access transport layer information in the network protocol, a network socket to access
3 network layer information in the network protocol, a link socket to access link layer
4 information in the network protocol, and a physical socket to access physical port
5 information in the network protocol.

1 13. The method of claim 1 wherein the IL API provides a different socket
2 communication interface for each layer of communication available in the network protocol.

1 14. The method of claim 1 wherein an application communicates with the IL API
2 using object –oriented instructions and the IL API interfaces with the network protocol
3 through instructions executable on a virtual-machine compatible with the network protocol
4 stack.

1 15. The method of claim 13 wherein the object-oriented instructions are
2 compatible with the Java programming language.

1 16. An apparatus for accessing information about a resource associated with a
2 network device, comprises:
3 a processor;
4 a memory for storing instructions when executed on the processor that causes the
5 processor to,
6 receive a request from an application for information about a resource associated with
7 a network device;
8 select a layer in a network protocol stack having multiple layers for communicating
9 with the requested resource associated with the network device;
10 establish an inner layer socket for communicating at the selected layer using an inner
11 layer application programming interface (IL API) and a socket identifier associated with the
12 requested resource, wherein the inner layer socket communicates using the selected layer and
13 bypasses other layers in the network protocol stack;
14 transmit the request for information about the resource through the inner layer socket
15 and the socket identifier ;
16 receive the information about the resource in response to the transmission made
17 through the inner layer socket; and
18 pass the information about the resource through the inner layer socket to the
19 application making the request.

1 17. The apparatus of claim 16, wherein said request includes header information
2 associated with a transport layer and the inner layer socket is a transport socket.

1 18. The apparatus of claim 17 wherein the network protocol stack is compatible
2 with TCP/IP and the transport socket is compatible with a TCP or UDP transport layer
3 protocol.

1 19. The apparatus of claim 16, wherein said request includes header information
2 associated with a network layer and the inner layer socket is a network socket.

1 20. The apparatus of claim 19 wherein the network protocol is compatible with
2 TCP/IP and the network socket is compatible with an IP network layer protocol.

1 21. The apparatus of claim 16, wherein said request includes header information
2 associated with a link layer and the inner layer socket is a link socket.

1 22. The apparatus of claim 21 wherein the network protocol is compatible with
2 TCP/IP and the link socket is compatible with a link layer protocol.

1 23. The apparatus of claim 16 wherein selecting a layer in a network protocol
2 stack further includes determining the layer in the network protocol stack that the requested
3 resource uses for communication.

1 24. The apparatus of claim 16 wherein the IP layer in a TCP/IP network protocol
2 is selected when a Internet Control Message Protocol (ICMP) resource communicates at the
3 network layer in the network protocol.

1 25. The apparatus of claim 16 wherein the link layer in a TCP/IP network
2 protocol is selected when an Address Resolution Protocol (ARP) resource communicates at
3 the link layer in the network protocol.

1 26. The apparatus of claim 16 wherein the physical layer in a network protocol is
2 selected when a physical port resource uses the physical layer for communication.

1 27. The apparatus of claim 16 wherein the IL API provides a transport socket to
2 access transport layer information in the network protocol, a network socket to access
3 network layer information in the network protocol, a link socket to access link layer
4 information in the network protocol, and a physical socket to access physical port
5 information in the network protocol.

1 28. The apparatus of claim 16 wherein the IL API provides a different socket
2 communication interface for each layer of communication available in the network protocol.

1 29. The apparatus of claim 16 wherein an application communicates with the IL
2 API using object –oriented instructions and the IL API interfaces with the network protocol
3 through instructions executable on a virtual-machine compatible with the network protocol
4 stack.

1 30. The apparatus of claim 29 wherein the object-oriented instructions are
2 compatible with the Java programming language.

1 31. An apparatus for accessing information about a resource associated with a
2 network device, comprising:

3 means for receiving a request from an application for information about a resource
4 associated with a network device;

5 means for selecting a layer in a network protocol stack having multiple layers for
6 communicating with the requested resource associated with the network device;

7 means for establishing an inner layer socket for communicating at the selected layer
8 using an inner layer application programming interface (IL API) and a socket identifier
9 associated with the requested resource, wherein the inner layer socket communicates using
10 the selected layer and bypasses other layers in the network protocol stack;

11 means for transmitting the request for information about the resource through the
12 inner layer socket and the socket identifier ;

13 means for receiving the information about the resource in response to the
14 transmission made through the inner layer socket; and

15 passing the information about the resource through the inner layer socket to the
16 application making the request.

1 32. A computer program, tangibly stored on a computer-readable medium,
2 comprising instructions for accessing information about a resource associated with a network
3 device, comprising:

4 receiving a request from an application for information about a resource associated
5 with a network device;

6 selecting a layer in a network protocol stack having multiple layers for
7 communicating with the requested resource associated with the network device;

8 establishing an inner layer socket for communicating at the selected layer using an
9 inner layer application programming interface (IL API) and a socket identifier associated
10 with the requested resource, wherein the inner layer socket communicates using the selected
11 layer and bypasses other layers in the network protocol stack;

12 transmitting the request for information about the resource through the inner layer
13 socket and the socket identifier ;

14 receiving the information about the resource in response to the transmission made
15 through the inner layer socket; and
16 passing the information about the resource through the inner layer socket to the
17 application making the request.